Small Business Innovation Research/Small Business Tech Transfer

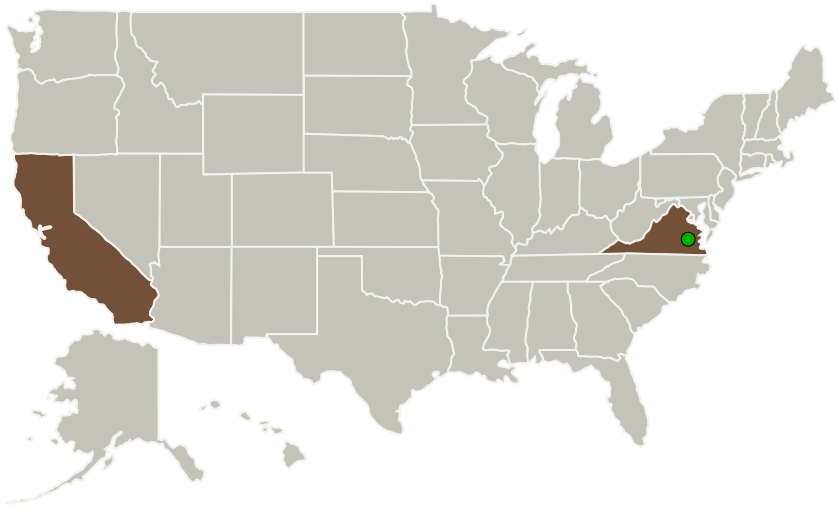
Multifunctional Structural Composites for Radiation Shielding, Phase II

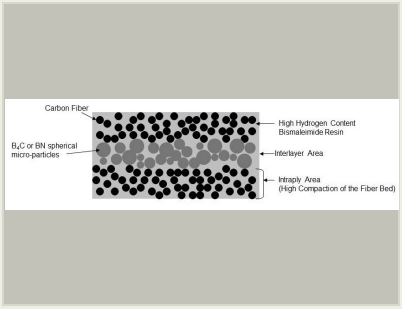
Completed Technology Project (2016 - 2018)

Project Introduction

Radiation shielding materials are necessary for protecting astronaut crews from the hazards of space radiation during future NASA missions. Although polyethylene based materials and composites are attractive for radiation shielding due to high hydrogen content, the poor thermal performance has limited its use as a parasitic, nonstructural material. Further impeding use of this material is its inherent flammability. Accordingly, thermally stable structural materials having low flammability combined with radiation shielding are necessary for the development of next generation aerospace structures and vehicles. It would be further desirable that the non-parasitic material has excellent damage tolerance to mitigate impact events in operation. Applied Poleramic, Inc. proposes to develop a new generation of structural high hydrogen content matrix materials which will be combined with an interlayer modification approach to result in fiber reinforced composite materials having enhanced radiation shielding combined with excellent damage tolerance and improved flammability resistance.

Primary U.S. Work Locations and Key Partners





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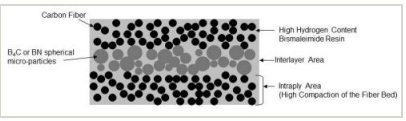
Organizations Performing Work	Role	Type	Location
Applied Poleramic, Inc.	Lead Organization	Industry	Benicia, California
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
California	Virginia

Images



Briefing Chart Image
Multifunctional Structural Composites for Radiation Shielding, Phase II
(https://techport.nasa.gov/image/132339)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Applied Poleramic, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

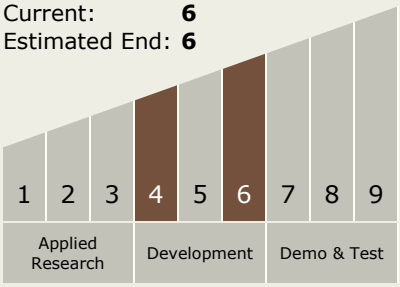
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Brian S Hayes

Technology Maturity (TRL)

Start: **4**
Current: **6**
Estimated End: **6**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.5 Radiation
    - TX06.5.3 Protection Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System